

IMPROVED FLUIDIZING OXIDATION PROTECTION SYSTEMS

ABSTRACT OF THE DISCLOSURE

Carbon composite components (1, 11, 22, 30), which may be aircraft brake discs, heat exchanger cores, and so on, are covered by protective coating 32. Component (1, 11, 22, 30) is immersed in liquid bath precursor of fluidized glass (step 55). After immersion step, glass-coated component (1, 11, 22, 30) is removed and annealed. Heat treatment gradually increases temperature to 250-350°C at the rate of 1-2°C per minute (step 60). Heat treatment is followed by soak at temperature of 250-350°C for 1-10 hours (step 65). Temperature is then increased to 550-650°C (step 70). Temperature is maintained at 550-650°C for 1-10 hours (step 75). After completion of second prolonged heat treatment, the component is cooled until reaching room temperature (step 80). Upon completion of the annealing step, the fluidized glass coating converts to solid glass coating (32) enveloping and forming a protective barrier against undesirable oxidation of the C-C component (1, 11, 22, 30). For application to thin-gauge composites, the glass precursor components contain 20-60 weight-% water, 25-50 weight-% phosphoric acid, 2-20 weight-% alkali metal hydroxide, 1-10 weight-% manganese phosphate, 1-10 weight-% boron nitride, 0-5 weight-% elemental boron, and 10-28 weight-% boron carbide.